



Review papers

Testate amoebae in pollen slides

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ABSTRACT

Among the non-pollen micro-fossils commonly encountered in Quaternary sediment samples prepared for pollen analysis are many shells of testate amoebae. Testate amoebae are eukaryotic micro-organisms which are increasingly used in ecological and palaeoecological studies, particularly as indicators of hydrological change in *Sphagnum*-dominated peatlands. In this study we address the extent to which testate amoebae are used in palynological research, the key challenges to more widespread use, and the extent to which ecological information is retained in the testate amoeba assemblages of standard palynological slides. To achieve this we review the literature on the use of testate amoebae in palynology, compare testate amoeba records produced by palynological and water-based preparation methods and carry out simulations using previously-derived datasets. Our results show that testate amoebae are widely encountered in Quaternary palynological studies, primarily in peatlands, but the information which they can provide is undermined by limited taxonomic knowledge. Many taxa are destroyed in pollen preparations, but for taxa that are retained patterns of abundance parallel those determined using water-based preparation methods. Although the loss of sensitive taxa limits the ecological information contained in testate amoeba assemblages the information preserved is likely to be useful in a multiproxy approach to palaeoenvironmental reconstruction. To help improve taxonomic awareness and encourage the use of testate amoebae in palynology we present a basic introduction to testate amoeba taxonomy and a guide to the taxonomic literature.

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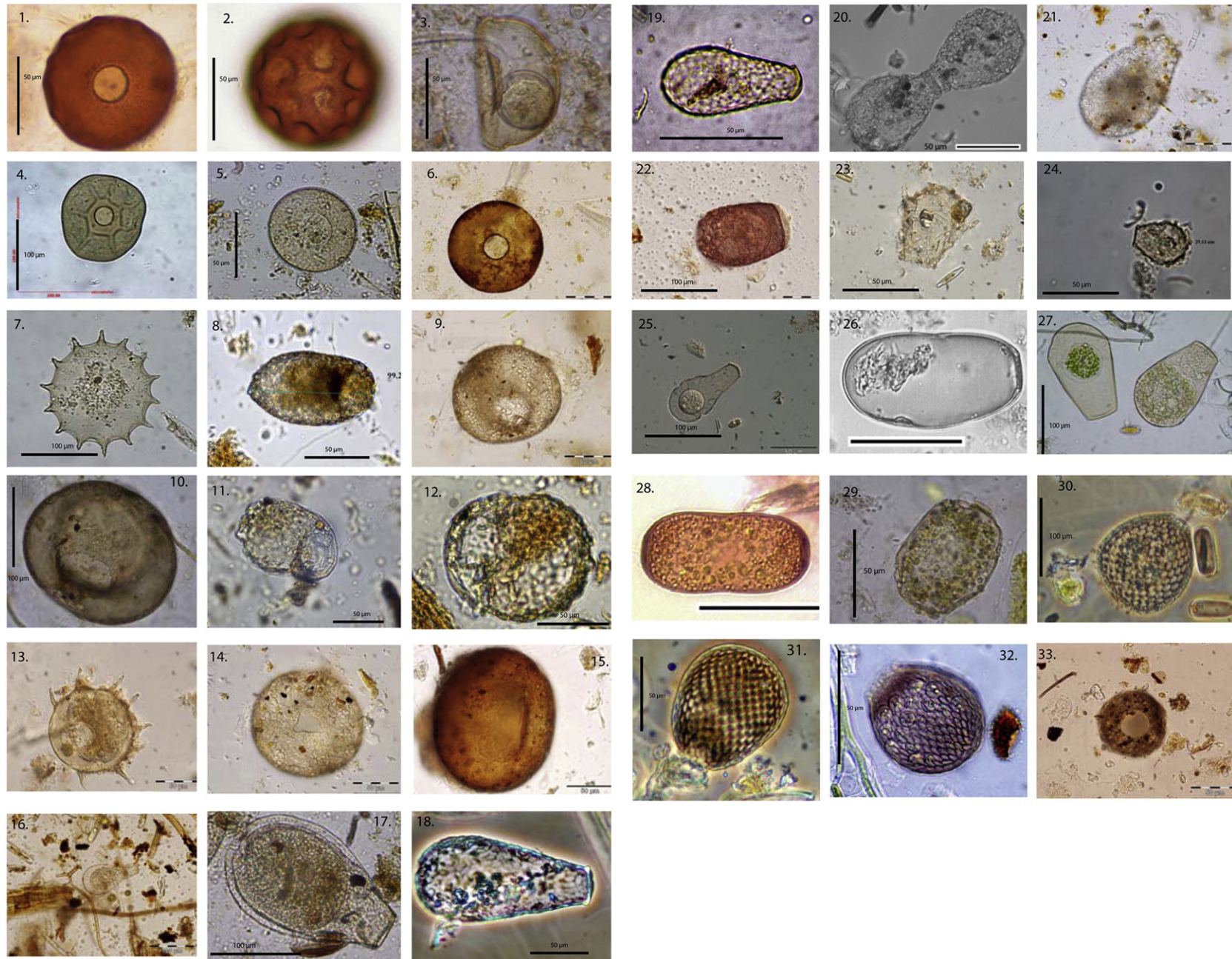


Fig. 1. Photomicrographs of selected testate amoeba taxa which may survive pollen preparations. 1–2. *Arcella gibbosa*, 3. *Arcella hemispherica*, 4. *Arcella catinus*, 5. *Arcella discoides*, 6. *Arcella vulgaris*, 7. *A. dentata*, 8. *Centropyxis constricta*, 9. *C. laevigata*, 10. *C. eornis*, 11. *C. platystoma*, 12. *C. aerophila*, 13. *C. aculeata*, 14. *Trigonopyxis arcuata*, 15. *Bullinularia indica*, 16. *Nebela langeniiformis*, 17. *N. carinata*, 18. *N. penardiana*, 19. *N. militaris*, 20. *Physochila griseola*, 21. *Argynnia dentistoma*, 22. *Heleopera rosea*, 23. *Diffugia leidy*, 24. *D. pulex*, 25. *Hyalosphenia elegans*, 26. *H. subflava*, 27. *H. papilio*, 28. *Archerella flavum*, 29. *Amphitrema wrightianum*, 30. *Assulina scandinavica*, 31. *A. seminulum*, 32. *A. muscorum*, 33. *Phryganella acropodia*.

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